

Subject- Botany

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Paper -1 (Diversity of Algae , Lichens and Bryophytes)

Topic- Characteristic feature of groups of Bryophytes

Class I. Hepaticopsida (Liverworts)

General Characters:

1. This class includes about 280 genera and 9500 species.
2. The name of this class is derived from a latin word Hepatica which means liver. Hence members of this class are commonly known as liverworts.
3. Plant body is gametophytic and the gametophyte is either thalloid or folios.
4. Thalloid forms are prostrate, lobed, dorsiventral and dichotomously branched.
5. In foliose forms, 'leaves' are entire, lobed or divided and without 'midrib'.
'Leaves arranged in two to three rows on the axis.
6. Rhizoids are unicellular and branched.
7. Photosynthetic cells contain many chloroplasts.
8. Pyrenoids are absent.
9. Sex organs are borne dorsally or apically, superficial or embedded in

10. Members may be monoecious or dioecious.
11. Sporophyte is either simple or represented by capsule only (e.g., Riccia) or may be differentiated into foot, seta and capsule (e.g., Marchantia).
12. Archegonium is endothecial in origin.
13. Sporogenous tissue either forms only spores (e.g., Riccia) or is differentiated into sterile elater mother cells and fertile spore mother cells.
14. Columella is absent in the capsule.
15. Elaters are unicellular, hygroscopic with spiral thickenings.
16. Capsule wall is one to several layers thick and without stomata.
17. Dehiscence of the capsule is irregular or in definite number of valves.
18. Spores on germination form the gametophytic plant body.
19. Plants show heteroic alternation of generation.

Class II. Anthocerotopsida (Hornworts)

General Characters:

1. This class is represented by about 6 genera and 300 species.
2. Plant body is flat, dorsiventral, thalloid, gametophytic and variously lobed.
3. Smooth walled rhizoids are present.
4. Tuberculated rhizoids and scales are absent.
5. Internally the thallus is not differentiated into zones.
6. All cells are alike.
7. Air chambers or air pores are absent.
8. Each cell has a single chloroplast and each chloroplast contains a single pyrenoid.
9. Mucilage cavities open on the ventral surface by slime pores.

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10. Sex organs are embedded in the thallus.
11. Antheridia develop either singly or in groups in closed cavities called antheridial chambers.
12. The sporophyte is differentiated into foot, an intermediate zone or meristematic zone and capsule.
13. Due to the presence of the meristematic zone, the sporophyte shows indeterminate growth i.e., it continues to grow indefinitely.
14. Archegonium is amphithecium in origin.
15. Sporogenous tissue forms the fertile spores and sterile elaters. Elaters do not have spiral thickenings and are known as pseudo elaters.
16. Capsule wall is four to six layered thick and epidermis has the stomata.
17. Capsule matures from apex to base and usually dehisce by two valves.

Class III. Bryopsida (Mosses)

General Characters:

1. It is the largest class in Bryophyta and includes about 700 genera and 14,000 species.
2. The main plant body is gametophytic and can be differentiated into two stages-juvenile stage and leafy stage or gametophore.
3. Juvenile stage is represented by green, filamentous branched structures called protonema. It develops from the germination of the spore.
4. Gametophores are erect leafy branches which develop on the protonema.
5. Gametophores can be branched or un-branched and can be differentiated into three parts-rhizoids, '**stem**' and '**leaves**'.
6. Branches arise below the '**leaves**'.
7. '**Leaves**' are with midrib, un-lobed and arranged spirally in three to eight rows on the axis or
8. Rhizoids are multicellular, filamentous, branched with oblique septa.

9. The axis is differentiated into central conducting strand enclosed by cortex.
10. Sex organs borne apically in the groups on main '**stem**' or a branch.
11. The sporophyte is green in early stages and can be differentiated into foot, seta and capsule.
12. The seta is usually elongated and rigid.
13. Columella is usually present and endothecial in origin.
14. Archegonium (spore forming tissue) is differentiated only in spores.
15. Elaters are absent.
16. Dehiscence of capsule takes place by separation of lid or operculum .
17. Peristome helps in the dispersal of spores.
18. Spores on germination produce the protonema.